What is claimed is:

1. A method for determining state variables and parameters of a mathematical energy storage model, particularly of a battery model, with the aid of a state variable and parameter estimator (1), which, from operating variables (U_{Batt}, I_{Batt}, T_{Batt}) of an energy storage device (3), calculates the state variables (Z) and the parameters (P) of the mathematical energy storage model,

wherein the state variable and parameter estimator (1) includes a plurality of mathematical submodels (4, 5) which are validly applicable for different working ranges and or frequency ranges of the energy storage device (3).

- 2. The method as recited in Claim 1, wherein a current (I_{Batt}) or a voltage (U_{Batt}) of the energy storage device (3) is supplied to the submodels (4, 5), the current (I_{Batt}) or the voltage (U_{Batt}) being restricted by a filter (6, 7) to the frequency range valid for a submodel (4, 5).
- 3. The method as recited in Claim 1 or 2, wherein an error between an operating variable (U_{Batt} , I_{Batt}) of the energy storage device and an operating variable ($U_{Batt^{\wedge}}$, $I_{Batt^{\wedge}}$) calculated by a submodel (4, 5) is ascertained and fed back into the respective submodel (4, 5).
- 4. The method as recited in one of the preceding claims, wherein the error between an operating variable (U_{Batt} , I_{Batt}) of the energy storage device (3) and the operating variable (U_{Batt^*} , I_{Batt^*}) calculated by a submodel (4, 5) is fed back into another submodel (5).
- 5. The method as recited in Claim 3 or 4, wherein the error is weighted using a factor (k).
- 6. The method as recited in one of the preceding claims, wherein a state variable (Z) calculated by a submodel (4, 5) and/or a calculated parameter (P) are supplied to another submodel (5).
- 7. The method as recited in Claim 6, wherein the state variables (Z) or parameter (P) are fed back weighted.

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- 8. The method as recited in one of the preceding claims, wherein a stimulator (16) is provided in order to bring the current (I_{Batt}) or the voltage (U_{Batt}), that will be supplied to the submodels (4, 5) into a desired working range or frequency range.
- 9. A state variable and parameter estimator (1) for determining state variables (Z) and parameters (P) of a mathematical energy storage model, particularly of a battery model, which calculates the state variables (Z) and the parameters (P) of the mathematical energy storage model from the operating variables (U_{Batt}, I_{Batt}, T_{Batt}) of an energy storage device (3), wherein the state variable and parameter estimator (1) includes a plurality of submodels (4, 5) which are valid for different working ranges and/or frequency ranges of the energy storage device (3).
- 10. The state variable and parameter estimator (1) as recited in Claim 9, wherein a filter (6, 7) is preconnected to at least one of the submodels (4, 5) in order to restrict the operating variable (U_{Batt}, I_{Batt}), of the energy storage device (3), that is supplied to the submodel (4, 5), to the frequency range that is valid for the submodel (4, 5).
- 11. The state variable and parameter estimator (1) as recited in Claim 9 or 10, wherein the state variable and parameter estimator (1) is designed so that an error between an operating variable (U_{Batt} , I_{Batt}) of the energy storage device (3) and an operating variable ($U_{Batt^{\wedge}}$, $I_{Batt^{\wedge}}$) calculated by a submodel (4, 5) is ascertained and fed back into the respective submodel (4, 5).
- 12. The state variable and parameter estimator (1) as recited in one of Claims 9 through 11, wherein the state variable and parameter estimator (1) is designed so that an error between an operating variable (U_{Batt}, I_{Batt}) of the energy storage device (3) and an operating variable (U_{Batt}, I_{Batt}) calculated by a submodel (4, 5) is fed back into another submodel (5).
- 13. The state variable and parameter estimator as recited in one of Claims 9 through 12, wherein an apparatus (10 13) is provided for weighting the error that is fed back.
- 14. The state variable and parameter estimator (1) as recited in one of Claims 9 through13,wherein a stimulator (16) is provided in order to bring the current or the voltage curve (I_{Batt},

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U_{Batt}), that will be supplied to the submodels (4, 5), into a desired working range or frequency range.

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